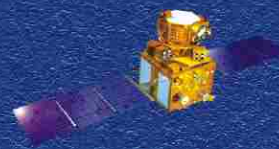


# CONTACT



Volume 6 No.2

September, 2004

**Indian Institute of Remote Sensing**  
(National Remote Sensing Agency),

4 Kalidas Road, Dehradun, Tel : 91-135- 2744518  
email : dean@iirs.gov.in, web : www.iirs-nrsa.org

*...on mission for transferring technology through training and education*

## ***New DEAN IIRS: Dr. V.K. Dadhwal***



Consequent to Dr P.S.Roy's transfer to NRSA headquarters Dr. Vinay Kumar Dadhwal has assumed charge of the post of DEAN of Indian Institute of Remote Sensing (National Remote Sensing Agency).

Dr. Dadhwal is a leading scientist in the areas of Remote Sensing applications in Agriculture and Terrestrial Carbon cycle. Dr. Dadhwal had his B.Sc (Hons) in Botany from Hansraj College, University of Delhi. He has his M.Sc (1978) and PhD (1983) in Plant Physiology from Indian Agricultural Research Institute, New Delhi. Dr. Dadhwal was working at Space Applications Centre (SAC) of ISRO at Ahmedabad during 1983 to 2004. Dr. Dadhwal was heading the Crop Monitoring Division at SAC, Ahmedabad. For his scientific contributions, he is a recipient of many prestigious awards like Young Scientist award (1987), ISCA, Young scientist medal 1989, INSA, Indian National Remote Sensing (ISRS) Award (1998) and Hari Om Ashram Prerit Dr. Vikram Sarabhai Award for Space Applications (1999). He was also a Member of Transition Team of iLEAP, IGBP-II(2003) and Co-chair, ISPRS Working Group VII/6-Monitoring Global Change(2002-2004).

IIRS family heartily welcomes its new DEAN.

## ***Transfer: Dr. P.S. Roy, to NRSA***



Dr. P.S. Roy has assumed charge of the Deputy Director (RS & GIS-Application Areas), National Remote Sensing Agency (NRSA), Hyderabad.

Dr. Roy joined Indian Institute of Remote Sensing (NRSA) in October 1984 as Scientist 'SE' in Forestry and Ecology Division. In October 1987, he took over as Head Forestry and Ecology Division. In February 1998 he took over as Dean Indian Institute of Remote Sensing. In between, Dr. P.S. Roy was assigned position of Director of North-Eastern Space Application Centre (NE-SAC) for one year (March 2001 to February 2002) during its initial phase. He has also been assigned an additional responsibility of Deputy Director of Centre for Space Science & Technology Education in Asia &

*Continued Page2*

## ***Inside this issue***

### **Chairman ISRO Visits IIRS**

### **Report on Special Training Courses**

- Remote Sensing and GIS applications for ASEAN Countries
- Refresher course for Indian Forest Service Officers
- Remote Sensing & GIS Applications in Natural & Water Resource Management
- Colour photography course for the officers of L.N.J.P NICFS

### **Workshops/Tutorial/Seminars**

- International Workshop on "Sustainable Capacity Building on Urban Disaster Mitigation in Asia using Information Technology and C-Learning Tools" (CASITA)
- Earth Observation system for Environmental Disaster Management Capacity building, methods and challenges
- Establishment of NRIS Node at Port Blair Andaman and Nicobar Islands
- World Environment Day - 5th June 2004
- Remote Sensing Day - 12 August 2004

### **Research Communication**

Crop Modeling For Regional Wheat Productivity Analysis  
The Gentleman of India Tiger

### **Course Calendar 2005**

## ***ILWIS Software for IIRS ALUMNI***

This is to inform all the alumni that Integrated Land and Information System (ILWIS) VER 3.2 software developed by International Institute for Geoinformation Science & Earth Observation (ITC), The Netherlands is available from IIRS only for IIRS Alumni at a price of Rs. 5,000/- + Rs. 200/- (postal charges). All interested alumni can obtain application form and more details from Er. V. Hari Prasad, Incharge, Water Resources Division, IIRS, 4, Kalidas Road, Dehradun. E.-mail : [prasad@iirs.gov.in](mailto:prasad@iirs.gov.in) or [vbphari@yahoo.com](mailto:vbphari@yahoo.com).

## Chairman ISRO Visits IIRS

24<sup>th</sup> May 2004 was an important day for IIRS'ites. This day our new Chairman ISRO and Secretary, Dept of Space, Shri G. Madhvan Nair, visited IIRS to inaugurate the prestigious special training course on Remote Sensing and GIS Applications for ASEAN Countries.

In his inaugural address, chairman emphasized the potential of Satellite remote sensing in various societal domains. He said that "Managing resources in a sustainable manner, monitoring them with time and predicting the changes are the key applications of RS data. India, a developing country with population of more than 100 million, has been using satellite RS data in various applications for the betterment of life of the common people. I believe, the



*Chairman addressing the employees*

ASEAN countries, like India are also using RS data for various applications. In this context, this course will perfectly suit the aspirants of the participants for this programme."



*Chairman performing the Pooja and Guest House Inauguration*

The chairman inaugurated the newly built Guest House in the campus. The chairman appreciated the nicely built guest house, with 10 rooms and 2 VIP suites. The entire guest house is air conditioned. It also has two dining halls. The chairman also took a tour of all the divisions and facilities of the Institute. He was apprised about the various courses, research and project works in different divisions. The chairman also interacted with the institute trainees. In the evening chairman addressed all the employees of IIRS, RRSSC-D and CSSTEAP and kindly allowed employees to take photographs with him.



*Chairman inaugurating the Guest House of IIRS*



*Chairman with employees*

Minakshi Kumar

*Continued from Page 1*

Pacific (Affiliated to United Nations) (CSSTEAP) since May 2003.

He received many awards during his stay at IIRS namely, India National Remote Sensing Award (1991), Sri Hari Om Ashram Prerit Vikram Sarabhai Memorial Research Award (1993), FNIS (1996), B.P. Pal National Environmental Fellow Award (1996), FNAAS (1998), FIGU (1999), Recognition Award of NAAS (2001-02) and FNASc (2002).

*We wish him good Luck for all his endeavors.*

## Editorial Committee

### EDITOR

Ms. Minakshi Kumar

### MEMBERS:

Sri. D.Mitra, Dr. N.R.Patel, Sri. Arun Sardar,  
Dr. Rajat Chatterjee, Sri. R.K.Singh, Dr. P.K.Joshi

# Contact

## International Training course on Remote Sensing and GIS Applications for ASEAN countries

India has had close cultural and economic ties with Southeast Asian countries throughout history. India and Association of Southeast Asian Nations popularly known as ASEAN, are no longer just maritime neighbours but share a land boundary of over 1600 km. Besides India ASEAN's other full Dialogue Partners are Australia, Canada, China, European Union, Japan, New Zealand, Republic of Korea, Russia & USA.

In space technology, the areas identified for cooperation in the initial stages included capacity-building, training, formal education, on-the-job attachment and exchange of scientists, besides use of Indian Remote Sensing (IRS) data for environmental management such as forest fire monitoring, marine and coastal management.



*Chairman releasing the Lecture notes*

The first training course under the first phase of ASEAN INDIA cooperation in space technology was offered at Indian Institute of Remote Sensing, Dehradun between 24<sup>th</sup> May 2004 & 4<sup>th</sup> June 2004. The course has been funded by Ministry of External Affairs, Govt. of India.

The course was formally inaugurated by Shri. G. Madhvan Nair, Chairman ISRO on 24<sup>th</sup> May 2004. In his inaugural address the chairman emphasised that the fruits of the space technology should reach the village level and thus in overall development of the country.

The program was also attended by Shri. V. Sundararamaiah, Scientific Secretary, Dr. K. Thygarajan, Programme Director IRS & SSS, (DOS), Shri V. Jayaraman, Director Earth Observation System and Dr. R. R. Navalgund, Director National



*Chairman releasing the CD Rom*

Remote Sensing Agency (NRSA), Hyderabad. Dr. Navalgund welcomed all the participants and mentioned about the progress being made in different projects at National and International level in the organisation. Dr. Roy, Dean, Indian Institute of Remote Sensing conveyed his gratitude to the ASEAN countries for nominating the course participants. The function was attended by large number of scientists and other employees of the institute.

Ten(10) course participants from 8 ASEAN countries namely Cambodia, Darussalam, Indonesia, Lao PDR, Malaysia Philippines, Thailand & Vietnam joined the course.

Within a short spell of two weeks duration various topics related to the technology and



*Surveyor General of India Dr. P. Nag addresses the students*

applications of Remote Sensing and GIS were covered in theory lecture

classes, followed up by practical demonstrations & field visits. Expert faculty from SAC, Ahmedabad, NRSA Hyderabad, ADRIN Secunderabad and ISAC Bangalore were invited to deliver Lectures on specialized topics.

The experience gained by invited faculty in Indian Remote Sensing programme related case studies and projects was elaborated during discussions and presentations. As an effort of combining training and recreation, the participants are also taken to Mussoorie area for short field visit. After the course formal feedback is



## Contact



*Feedback Remarks by a course participant*

taken from the course participants. Most of the officer trainees suggested for increase in the course duration.

The Lecture notes, provided by IIRS and Guest Faculty were printed in book form as well as on CD in soft copy form for distribution to Course participants. This course material was released by chairman ISRO during inauguration of the course.

Passing out function of the course was held on the concluding day, June 4, 2004.

Chief Guest of the function, Dr. Prithvish Nag, Surveyor General of India, distributed the certificates to the course participants.

Prof. S.K. Govil

### *One week compulsory refresher course for Indian Forest Service Officers, June 21-25, 2004*

A special one week Ministry of Environment and Forests, Government of India sponsored training course was organized by Forestry and Ecology Division from 21 - 25, June 2004 to familiarize the senior forest officers on potentials of remote sensing and GIS in forestry. The course was attended by twelve forest officer namely Shri (s) R.K. Singh (Haryana), M.S. Mallik (Haryana), R. K. Gupta (MP), S.P. Sharma (MP), S. Senthil Kumar (A&N Islands), A.K. Wahal (Goa), P.K. Sharma (AP), V. Jairam (Jharkhand), M.C. Dubey (J&K), V.S. Rathore (Rajasthan), U.S. Rawat (Rajasthan) and V. Thiruvnavu Karsu (Tamilnadu).



Lectures and practicals highlighting a variety of applications of the two technologies in forestry were organized for four and a half day. The course participants also made a half day field visit to Mussoorie. There were group discussions for all and tutorial for those requiring extra briefing. The bound copy of lecture notes was provided in advance to improve the interaction between faculty and the course participants. As per the feedback the trainees liked the way the course was conducted, commented favorably on course contents and enjoyed their stay at IIRS campus. The faculty felt happy interaction directly with forest officers to understand the problems being faced by field officers on forest resource assessment and monitoring. It was indeed an honor to IIRS for being selected for training by the Ministry of Environment and Forests, Government of India, New Delhi.

Dr.S.PS. Kushwaha

### *Special Course for PWD Officers*



In recent times, the application of geo-spatial techniques for natural resources management has increased considerably. Such modern tools are being used extensively at an operational level in many organizations. The benefits of remote sensing and geographic information systems technology are playing a decisive role in resource management & utilisation as well.

On request from Govt. of Pondicherry, a special course on "Remote Sensing & GIS Applications in Natural & Water Resource Management" was organised at Water Resources Division, IIRS during July 6-9, 2004 for the Officers of Tank Rehabilitation Project, Public Works Department, Pondicherry. The Tank Rehabilitation Project is funded by The European Commission for rehabilitating 84 tanks in the Union Territory of Pondicherry with a total command area of about 6500 ha. Nine officer trainees including the project consultant from ARCADIS, The Netherlands, participated in this course.

R. K. Singh

# Contact

## Special Colour photography course



A two weeks Special Colour photography course for the officers of Lok Nayak Jai Prakash Narayan National Institute of Criminology and Forensic Sciences was organized by Photo Processing Division from 5<sup>th</sup> - 16<sup>th</sup> July 2004. The course was attended by four officer trainees.

During the course Lectures on colour photography were delivered and practical exercises were conducted. The topics covered ranged from colours of light, color vision, additive and subtractive color principles Hue saturation and brightness, colour temperature, conversion and colour processing filters. In the practical exercise, measurement of exposure for various outdoor scenes, exposing of color film, colour transparency film processing, color negative film and slide film were carried out.

S.P Mavgain

## International Workshop on “Sustainable Capacity Building on Urban Disaster Mitigation in Asia using Information Technology and C-Learning Tools” (CASITA)

Indian Institute of Remote Sensing (NRSA), organized an International Workshop on “Sustainable Capacity Building on Urban Disaster Mitigation in Asia using IT & C Learning tools” (CASITA) in collaboration with the Asian Disaster Preparedness Center (ADPC) Bangkok, Thailand, International Institute for Geo-information Science and Earth Observation (ITC), The Netherlands and Ecole Nationales des Science Geographiques (ENSG), France from 16<sup>th</sup> March to 19<sup>th</sup> March, 2004 at IIRS campus.

The objective of the workshop was to bring together all the universities/ institutions of Asia which are participating in the CASITA project to discuss the progress in the field of initiation of various course programmes, curricula development in the area of Hazard Mapping, Risk Assessment, Disaster management and Mitigation. It was also an occasion to assess the progress of initiative of first CASITA workshop held in Bangkok and sharing of cases studies developed by the CASITA project participating universities / Institutions.



Director, NRSA delivering the inaugural address

From ten countries viz. Bangladesh, India, Indonesia, LAO PDR, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam, 28 participants representing 17 universities / Institutions took part in this workshop. For this workshop eight faculty members, 2 from ITC, Netherlands, 2 from ENSG France 3 from ADPC Bangkok and one from UN OOSA Vienna also interacted with the participants.



Workshop Participants and faculty

Dr. R.R. Navalgund, Director, National Remote Sensing Agency, Hyderabad inaugurated the workshop on 16<sup>th</sup> March 2004. Dr. PS. Roy, Dean IIRS welcomed the guests and participants while Dr. Cees Van Westen, ITC, Netherlands, Dr. N.M.S.I. Arambepola, ADPC, Bangkok explained the various aspects and role of CASITA project to the participants.

During first two days the participants discussed among themselves about various courses and curricula development as well as case study development. In next one and a half day the participants presented case studies in various technical sessions. Eighteen case studies were presented during last one and a half day. The topics ranging from Earthquake, Landslide hazard, Flood, Heavy Metals Pollution, Urban Fire Risk Economic losses, modeling, prediction and mitigation were covered. Finally it was decided that all these case studies would be put into the BLACK BOARD website of ITC, The Netherlands for easy access to all CASITA project participating universities / Institutions.

B.S. Sokhi

## *Seminar on “Earth Observation system for Environmental Disaster Management Capacity building, methods and challenges” 29-30<sup>th</sup> June, 2004*

The collaboration between Indian Institute of Remote Sensing (IIRS/NRSA) and International Institute for Geoinformation Science and Earth Observation (ITC) spans over last 40 years. During this period there have been uninterrupted contacts and collaborations at institutional and personal scientific level. Over three distinct periods this collaboration was supported with funds from the Netherlands government. As from its initiation in 1966 till 1972, emphasis was placed on creating basic capability in training and education in aerial photo interpretation. During second phase from 1983 to 1988 and 1988-1990, emphasis was directed towards the establishment of Human Settlement Analysis Group (HUSAG). The third phase during 1994-1999 was directed towards upgrading infrastructure and faculty improvement in the field of Geoinformatics for Natural Resource Development and Environmental Planning and Management.

Based on the success of the earlier collaborations, infrastructural facility and regional concern, it was decided to start a new collaborative phase focusing on disaster management. As a result a new project was launched in collaboration with IIRS and other institutes from the Netherlands, namely International Institute for Geoinformation Science and Earth Observation (ITC), The Netherlands, International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE), and Wageningen University (WU) for capacity building in disaster management. The project started in July 2000, known as GEONEDIS and completed in July 2004.

### **The Aim and Objectives of the seminar**

In the project proposal it was envisaged to organize workshops/seminars on topics related to the objective of the project. The concluding seminar was held at IIRS, Dehradun during 29-30<sup>th</sup> June 2004. The aim of the seminar was to appraise the benefits of the “Geonedis” project in developing capacity of IIRS in imparting training and education in Geoinformatics for disaster management. Additionally it aimed to assess the future challenges and possible strategy to incorporate in the education programme of IIRS to meet the user requirement in a sustained manner. It also aimed to provide opportunity to strengthen the contact with user departments to institutionalize the application of geoinformatics in disaster management. It will also provide direction to take up research on thrust/gap areas to further develop capacity in geoinformatics and its applications.

Dr. PS.Roy, Dean, IIRS welcomed the dignitaries of the workshop and in his brief remark he emphasized the usefulness of remote sensing and GIS for disaster monitoring and management. Dr. R.S.Tolia, Chief Secretary, Govt. of Uttaranchal inaugurated the workshop and gave his inaugural address. He briefed the audience about the major disasters in the state viz. Landslide, Earthquake etc. and also the potential of satellite data for combating these disasters. He praised the role of Indian Institute of Remote Sensing towards this. He also highlighted the joint activities of IIRS and State departments in Uttaranchal.

Dr. Sjaak Beerens, Director, external affairs, ITC, the Netherlands, gave a talk on overall activities of the GEONEDIS Project and role of ITC on the capacity building in Geoinformatics. He complimented the role of IIRS for successful completion of this phase of Project and informed the audience about the future collaboration with ITC and Dept. of Space. He also highlighted the various earlier phases of collaboration with ITC and IIRS in his presentation.



*Dr. R.S.Tolia, Chief Secretary, Govt. of Uttaranchal, delivering the inaugural address.*

18 technical papers were presented during the two days workshop. Presenters were mainly from, Asian Disaster Preparedness Center- Bangkok, Indian Space Research Organisation Bangalore, ITC the Netherlands, Wadia Institute of Himalayan Geology Dehradun, North-Eastern Space Application Center Shilong, Space Applications Centers Ahmedabad, University of Assam Gauhati, Disaster Mitigation and Management Center Dehradun, National Remote Sensing Center Hyderabad, Karnataka State Remote Sensing Center Bangalore, Haryana Institute of Public Administration Gurgaon and Indian Institute of Remote Sensing Dehradun.

There were poster sessions at the foyer of IIRS auditorium where various posters of workshop theme were presented by Alumni of IIRS, ITC and CSSTEAP.

# Contact

Almost 100 registered delegates attended the workshop. The delegates represented various organizations involved in disaster related activities. Invitations were also sent to IIRS-ITC alumni of the Geoinformatics and Hazard & Risk analysis course, selected CSSTEAP students working on disaster related theme, ITC alumni and also the CSSTEAP students of 2003-2004 batch. All Retired scientist of IIRS who has contribution for the successful completion of this project were also invited. Prof. Karl Harmsen, Director, CSSTEAP and Prof. V.K. Jha, Head, RRSSC-D, were also among the distinguished delegates.



*Dr. Sjaak Beerens is addressing the audience*

## Future Directions of Research Themes for ITC/DOS

Future Research collaboration of ITC with DOS/ISRO was presented by Dr. Paul van Dijk on the behalf of Prof. Martin Hale who could not attend the workshop being indisposed. In his presentation, various new areas had been highlighted where ITC wants to work together in future. From ISRO/DOS side, Dr. V.K. Dadhwal Dean Designate, IIRS made a presentation in which he showed the potential areas where we should collaborate in times to come.



*Felicitating of Prof. A.M.J Meijerink, ITC*

## Felicitating of Prof. Meijerink

Prof. A.M.J. Meijerink, who was Head, Water Resources Division, ITC was felicitated during the occasion. Prof. Meijerink had a long association with IIRS and he was among the few faculties of ITC who delivered lectures in the first PG Diploma programme of IIRS. During the felicitating, Prof. Meijerink delivered a technical talk on "Remote Sensing for Groundwater Management, with implications for capacity building". Various distinguished personalities like Dr. D.P. Rao, Ex-Director, NRSA, Dr. P.S. Roy, Dean, IIRS, Prof. A.K. Roy, Ex-Head, Geosciences division, IIRS and Prof. B.M. Singh, Ex-Head, Soil Science Division, IIRS briefed about the contribution of Prof. Meijerink in the IIRS-ITC Project.

D. Mitra

## Establishment of NRIS Node at Port Blair Andaman and Nicobar Islands - March 22<sup>nd</sup> -25<sup>th</sup> 2004



National (Natural) Resources Information System (NRIS) Project for Andaman and Nicobar Islands was launched by the Department of Space (DOS) with the Indian Institute of Remote Sensing as a part of nationwide programme. The programme aims to ensure sustainable development and effective decision making in these remote islands. The NRIS Node in Andaman and Nicobar Islands will serve as one of the components of national network of GIS based nodes covering information of the whole country in the geographic domain.

NRIS Node provides information on natural resources related to land, water, forests, minerals, soils and socio-economic information such as demographic data, amenities, infrastructure etc. The database consists of integrated spatial/ non-spatial data elements comprising of the map inputs from remote sensing (Jai Vigyan Project Database) and conventional sources available with the sister departments. Shri P. L. N. Raju and Dr. M.C. Porwal played a key role in collecting information from the various sources and coordinating the database organization. Under the directions and guidance of Dr. P.S. Roy, Dean Indian Institute of Remote Sensing and Principal Coordinator NRIS Project, a team consisting of Dr. M. C. Porwal, Mr. C. Jeganathan and Ms. Stutee Gupta was constituted to ensure establishment of NRIS Node at *Van Sadan*, Department of Environment and Forests, Port Blair, Andaman and Nicobar Islands. Accordingly the hardware, software and database generated in the project were transferred to Port Blair and the node was established by installation of hardware and software on 22<sup>nd</sup> March 2004 at *Van Sadan*, Port Blair.

## Contact

On Tuesday 23<sup>rd</sup> March 2003, Shri S. R. Mehta, IFS, Principal Chief Conservator of Forests, Secretary Department of Environment and Forests and Department of Science and Technology, Andaman and Nicobar Islands inaugurated the National Natural Resource Information System (NRIS) Node in the premises of *Van Sadan*, Forest Department, Port Blair. Heads and officials from all major departments of Andaman and Nicobar Administration attended the function.

During the inauguration function, PCCF Shri S. R. Mehta mentioned that with the establishment of the NRIS Node at Forest Department, Port Blair, there lies an increased responsibility on them to ensure the sharing and further utility of this data with other departments as well. He said that they look forward to further co-operation and guidance from Indian Institute of Remote Sensing to continue this effort. He showed his deep gratitude to DOS for taking up this project in Andaman and Nicobar Islands. It was also emphasized that remote sensing and GIS technology will surely help for mapping and monitoring of forest resources of in these islands since forests cover almost 80% of the geographical area in these islands. Due to limited availability of land, increasing population and high vulnerability of the island ecosystems a need for more holistic approach was also stressed which is possible with the help of latest tools like remote sensing and GIS.

Based on the suggestions from Shri V.V. Bhat, Chief Secretary Andaman and Nicobar Administration, a user conference was also organized on 24<sup>th</sup> and 25<sup>th</sup> March 2004, which was attended by Secretaries and Heads from various Departments *viz.* Forest Department, Department of Science & Technology, Education Department, Electricity Department, Public Welfare Department, Agriculture Department, Fisheries Department *etc.* The participants showed their keen interest in the technology of remote sensing and GIS. The training was also conducted to familiarize the officials with the utilization of database. Certain specific queries related to planning and development of islands was also demonstrated so that the database generated under the project can be used by the planners and decision makers for effective management of the natural resources in these remote islands. More than fifty officials attended the training programme. A special training was imparted to the staff of *Van Sadan* for the proper functioning of the NRIS Node.

Stutee Gupta, C. Jeganathan and M. C. Porwal

### *IIRS Celebrates World Environment Day 5<sup>th</sup> June*

The Stockholm Conference on World Environment in 1972 agreed to celebrate 5<sup>th</sup> June every year to mark the day to care about our environment. Every year IIRS celebrates this day with full zeal and enthusiasm. On this day various activities such as sit & draw competition for the children of different age and classes groups, debate for students and staff and trainees were organized. Participation of children of different ages and classes in 'Sit and Draw' competition was most attractive. The future citizens of India put down their thoughts through colors on papers. A debate competition was organized on the topic 'Himalayas and Dams'. A wide spectrum of trainees, students and staff members participated in the activity. To mark the event as conservation day, the faculty, staff, trainees, researchers and others planted saplings of different kinds such as edible fruits, medicinal, aesthetic value etc., around new Guest House. A quiz competition organized, filled with the present statistics and general awareness about various activities going on in India regarding conservation of nature, and was most brain twisting and testing. At the end prizes were distributed to winner by the Dean, IIRS.



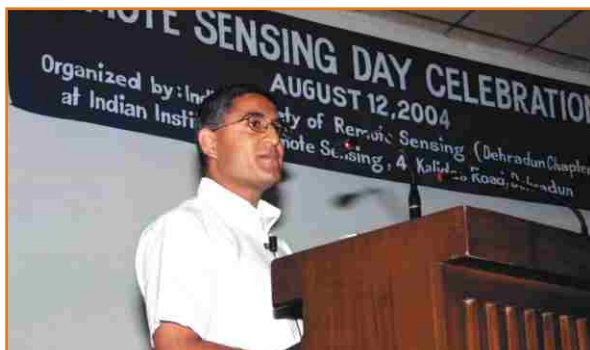
Dr. Sarnam Singh

### *IIRS Celebrates Remote Sensing Day-12<sup>th</sup> August*

Remote Sensing Day was celebrated on August 12, 2004 at Indian Institute of Remote Sensing by Dehradun Chapter of Indian Society of Remote Sensing (ISRS) with fervour and enthusiasm. As we all know, Remote Sensing Day is celebrated to pay tribute to the Architect of Indian Space Programme, Dr. Vikram Ambalal Sarabhai, who was born on August 12, 1919. Various events were organized to celebrate this occasion. A popular lecture on "Recent Development of Color Image Science & Imaging Systems" was delivered by Dr. Abhay Sharma, Associate Professor, Centre for Information Technology and Image Analysis, Western Michigan University, USA. He talked about various aspects of color science in a very lucid and interesting manner. His lecture was appreciated very much by all those who were present. Prof. V.K. Jha, Chairman, ISRS Dehradun Chapter, thanked the guest speaker. The next event was debate on a very relevant topic "Moon Mission : A Step in Right Direction". It was a very exciting event. Strong & logical arguments were put forward by the participants with facts & figures to support



# Contact



their point either in favour or against the motion. There were five prizes, in this event. The first prize was won by Sri S.G. Chavan, officer trainee of M.Sc. (Geoinformatics) Programme. The last event was open house Science Quiz. Interesting & relevant questions for the quiz attracted lot of people ready to answer them. The participants showed their eagerness by raising their hands frequently in response to the asked question. Prof. S.C. Gupta was at his best as a quiz master. There were 10 prizes in this event and the lucky people were selected as proud winner. At last the Dean, IIRS distributed the prizes to all the winners of the events.

R.K. Singh

## *Crop Modeling For Regional Wheat Productivity Analysis*

### Rationale

In last decade, yield stagnation have been observed experimentally in wheat belt of western UP region which is possibly an indication of environmental degradation. To overcome its long term consequences there is an urgent need to achieve sustainable wheat production system with minimum threat to environment and without sacrificing wheat productivity in this region. In order to develop sustainable farming, there is a prerequisite to define the temporal and spatial variability of environmental conditions within the region and to identify the biophysical constraints to crop production and resource management. This characterization allows scientists to set research priorities, to target breeding programs, to search for alternate soil and crop management schemes, and to guide the process of technology transfer.

Crop yield and crop yield variability are two of the five important criteria for sustainable land management. While average crop yields are often used to assess yield performance which is not particularly useful for evaluating sustainable farming system. This is because average yield represent a long-term normal, without providing information on performance changes over space and time. The solution undoubtedly lays in appealing geo-informatic tools to address the issues of crop yield and its variability on a regional scale. Though modeling crop yield in agriculture is a challenge for many researchers, vast potentialities exists in the use of satellite remote sensing and GIS for crop production forecasting which is of considerable importance in advance planning, formulation and implementation of policies related to food procurement, pricing, distribution and export/import, etc. Yield is influenced by culmination of several factors such as crop genotype, soil characteristics, agronomic practices, weather conditions and biotic stresses viz., weeds and disease and pests and the spectral data of crop is an integrated manifestation of the effects of all these factors on crop growth. Hence, yield forecasting system using satellite remote sensing is formed on the basis viz., (a) ability of satellite to supplies observations over large areas at even times and therefore provides crop monitoring techniques with possible spatial extent, (b) strong correlation between satellite derived vegetation indices (VIs) and the crop parameters. Remote sensing can provide actual state of crop parameters viz. LAI, FAPAR, crop distribution etc., while the GIS allow spatial organization of soil, weather, crop parameters and management data and display of crop model simulated results. Looking at enormous potential of RS and GIS, a project on "Crop Modeling for Regional Wheat productivity Analysis was initiated in Agric. & Soils Division under competitive Grant Programme of National Agricultural Technology Project, Indian Council of Agricultural Research (ICAR), New Delhi. Objectives, achievement and expected out come briefly follows:

### Objectives

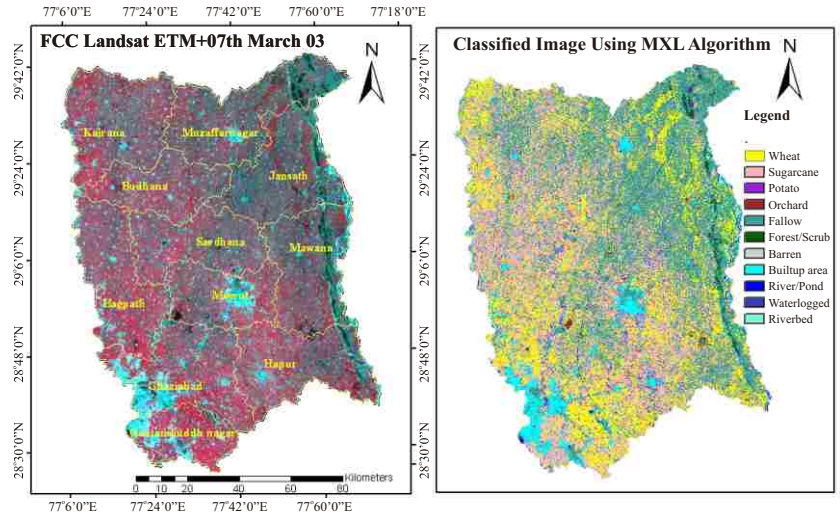
1. To derive biophysical parameters from satellite data for use in crop growth models.
2. To demonstrate integration of remotely sensed information in the model simulation for reasonably accurate yield estimation in wheat.
3. To develop and validate simple yield models for regional productivity analysis.
4. To identify biophysical and environmental constraints limiting productivity of wheat in western UP region.
5. To assess impact of climate change on wheat productivity

### Achievements made so far

- A preliminary work on crop yield models of wheat based on agrometeorological and historical yield data have been investigated and published for Meerut district.
- Wheat crop in western UP during year 2003 was discriminated with 90% and 87 % accuracy through supervised classification of LISS III and Landsat ETM satellite data. Area estimates of wheat in study area are 2.79 lakh and 2.37 lakh hectares with LISS III and Landsat ETM, respectively.

# Contact

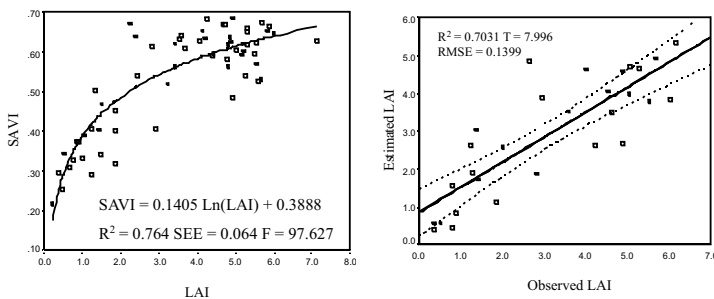
- To extract quantitative information on biophysical parameters, all satellite data, particularly, LISS III, Landsat ETM+, WiFS acquired at different times are atmospherically corrected using modified dark object subtraction method for retrieval of surface reflectance in different spectral channels.
- Various spectral vegetation indices (RVI, NDVI, SAVI, WdVI) were computed using atmospherically corrected surface reflectance in NIR and RED wavelength in order to develop empirical and semi-empirical model for biophysical parameter estimation (LAI, FAPAR) in wheat. These empirical models involving different vegetation indices showed  $R^2 > 0.7$  and F statistic significant at 95% level. The best empirical model involving SAVI and MSAVI for LAI and FAPAR had 0.764 and 0.865  $R^2$ , respectively.
- Validation studies revealed a close agreement between model estimated LAI (rmse = 0.139,  $R^2 = 0.703$ ) and FAPAR (rmse = 0.0182  $R^2 = 0.806$ ) with actual ground measurements. Semi-empirical (Clair model) model has relatively poor performance for retrieval of LAI and FAPAR during both vegetative and reproductive growth stages. These parameters will be used to iteratively adjust the simulated results by crop model.
- Incorporation of satellite measurements into deterministic biomass production model (Monteith, 1972) for regional wheat yield assessment has been investigated. The validation with tehsil-wise BES estimates showed that wheat yield can be estimated for approximately 60% of cases with relative deviation less than 5%.
- Spectral yield models having predictability of approximately 70% for wheat yield estimation in western UP were developed using both high and coarse resolution satellite data. Various spectral profile parameters are derived using multi-temporal MODIS data and their relation to tehsil-wise yield has been investigated. Poor correlation observed between spectral profile parameters and yield was ascribed to heterogeneity of crops in western UP.
- Total water use by wheat crop in western UP has been estimated on a spatial basis using satellite data for identifying whether variation in water utilization is limiting productivity of wheat. Total water use during wheat crop cycle explained 70% of variation in estimated regional wheat yield based on Monteith's model.
- Digital soil map with characteristics was prepared. Soil-scape unit-wise soil samples at various depths were analyzed to obtain soil water constant, texture, organic carbon and other chemical properties. Daily weather database of met stations within and surrounding study area is prepared. Average Sowing time at village has been done through NDVI threshold.



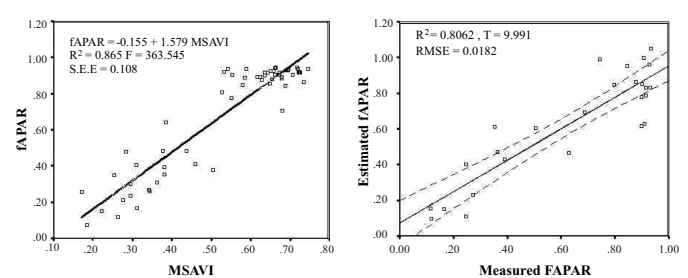
## Expected Outcome

- Methodology for reasonably accurate wheat yield estimation on a regional scale.
- Generation of spatial databases on surface state variables used in agro-ecosystem characterization.
- Assessment of impact of climate change on wheat productivity in order to formulate policy and mitigation measures.

Best empirical model for LAI retrieval



Best empirical model for FAPAR retrieval



## Biophysical parameter retrieval and its validation using satellite data

# Contact

## The Gentleman of India Tiger

India is a land of beautiful creatures. Among these Tiger is one of the royal animals. The characters in tiger are acute sensitivity, secretiveness, the ability to surprise; untiring perseverance, agility in attack, the tenacity to follow and the strength to overpower stand him unique. Tiger is not only the National Animal of India; it is the very essence of Indian wildlife. Tigers evolved in eastern Asia. The evolution of Tigers was from civet-like animals called *miacids* that lived during the age of the dinosaurs about 60 million years ago. These small mammals, with long bodies and short flexible limbs, evolved over millions of years into several hundred different species. There are approximately 37 cat species exist today, including *Panthera tigris*, the tiger. At the end last century there are about eight sub species of tiger comprising more than 100000 individuals roamed on earth. But in last fifty to sixty years three tiger sub species [Bali tiger (*Panthera tigris balica*), Javan tiger (*Panthera tigris sondaicus*), Caspian tiger (*Panthera tigris virgat*)] have become extinct mainly due to human persecution and habitat loss. Now there are only five tiger subspecies including the Indian or Bengal tiger (*Panthera tigris tigris*)-India, Siberian or Amur tiger (*Panthera tigris altaica*), Sumatran tiger (*Panthera tigris sumatrae*), South China tiger (*Panthera tigris amoyensis*), Indochinese tiger (*Panthera tigris corbetti*) on the earth.

A tiger weighs between 130 - 180kgs, an average height of 90cms and length of 2-8 m. They have a life expectancy ranging from 15 - 20 years. They eat an average of 5 kgs in a sitting and can eat up to 25 kgs in a day. Their breeding season begins towards the end of the monsoons and carries into the early months of winter. Tigers are aggressively territorial solitary animals and guard the prime area up to 1000 km<sup>2</sup>, which has the highest density of prey species.

India has the largest tiger population in the world. There are only 3,000 tigers remaining in India. Tigers live in a great range of habitats, essentially requiring sufficient prey populations, adequate cover to stalk or ambush, and access to water. The tigers' domain covers almost every corner of India. It is found in the lower Himalayan mountainous regions of the northern states of Uttar Pradesh and Uttaranchal to south states of Tamilnadu. Tigers may live in northern latitudes in snowy mountain hardwood forests, monsoon or seasonally deciduous forests, or in tropical rainforests.

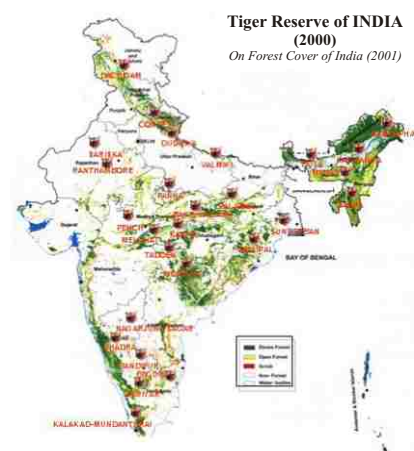
For some reason or the other, a part of mankind has always been in conflict with the tiger. When man encroaches on the land in which the tiger roams and hunts for his own survival, the latter is forced to trespass on the land "belonging" to man. Encroachment of the forest automatically results in the depletion of the tiger's prey species. This once again creates tension between the two and often results in the death of the tiger due to the poisoning, by man, of it's kill. It is due to this that a tiger has to very often cut short it's stalk and break into a charge to bring down a fleeing prey. Even with it's incredible powers of stalking and tremendous burst of speed, the tiger only has a success rate of below 20 percent. When a tiger gets injured due to some reason and is unable to perform at its best, it becomes more and more difficult for it to hunt successfully. Once a tiger loses its fear of man, it is one of the most dangerous animals in the world.

To protect these tigers from their extinct protected areas made. There are about 41 protected areas to protect the tigers in India. Project Tiger was launched in 1973 with nine tiger reserves covering an area of 16,339 km<sup>2</sup>, which has increased to 37,761 km<sup>2</sup> in 27 Tiger Reserves. For India, the tiger is not just a symbol but a species of great ecological significance. Protection of this animal automatically protects all the species that share its habitat. In contrast to the many threats to the tiger and its habitat our conservation measures are woefully inadequate.

These are the threats to the Tiger, which are bringing it to the brink of extinction. Loss, fragmentation, and degradation of forests have been the major factors in the decline of the tiger population in this century. Illegal Hunting for medicinal trade like hunting for tiger skins has been in demand for rugs, wall hangings, and fur coats. But in the late 1980s, bones and other parts became the principal targets to meet the demands for medicinal use in eastern Asia, primarily China, Taiwan, and South Korea and also in Southeast Asia. Poaching and Habitat Loss are other threats to tiger. The genetic threat like loss of variability and genetic deterioration follow, with lowered cub production and survival, which may not be apparent until they have reached a level that, threatens the population. Impact of Catastrophes events: natural disasters, such as forest fires, floods, hurricanes, and epidemics; and human-induced events, such as deforestation, and destruction of habitat are also responsible for the extinction of tiger species from the earth.

The tiger projects are introduced in order to secure and strengthen the future of tigers. The out put of these projects are Suppression of the illegal trade in tiger parts, strengthening protected areas management and anti-poaching operations, improving planning in tiger habitat, promoting participatory approaches to conservation, conducting surveys and research studies, promoting public education and awareness, facilitating international collaboration, generating additional financial resources for tiger conservation.

Pushpa P. Dash and P.K.Joshi



## Calendar of Training and Education Programmes for the year-2005

### INDIAN INSTITUTE OF REMOTE SENSING

Indian Institute of Remote Sensing (IIRS) under National Remote Sensing Agency is one of the premier Institute in South-East Asia for imparting training to the scientific and technical personnel in the field of Remote Sensing and GIS techniques with the prime objectives of the Training, Education, Research and Consultancy in Remote Sensing and GIS applications. This Institute functions under the parent body of National Remote Sensing Agency (NRSA), Department of Space, Government of India. The Institute offers regular training programmes in the field of Remote Sensing and GIS for Natural Resources Assessment and Disaster Management.

Transferring technology to the potential users by offering regular course programs; encouraging course participants to attempt solving their own problems in the dissertation or project work; participating in the user department's on-going research or pilot project in training or consultancy mode; providing co-guidance in M.Tech./Ph.D./Post-Doctoral programs work etc.

S. No.	Course Name	No. of Seats	Starting Date	Passing Out Date	Course Fee		
					Govt. Sponsored Indian	Open Candidates Rupees	Foreign Trainees US \$
<b>REMOTE SENSING &amp; GIS – MAPPING AND MONITORING OF NATURAL RESOURCES</b>							
1	Certificate Course (PRS)	5	7.3.2005	1.7.2005	Nil	24,000	2400
2	Post Graduate Diploma Course <sup>+</sup>	35	7.3.2005	30.12.2005	Nil	60,000	6000
<b>GEOINFORMATICS : TECHNOLOGY AND APPLICATION</b>							
3	Certificate Courses <sup>++</sup>	20	18.7.2005	11.11.2005	Nil	24,000	2400
4	Post Graduate Diploma in Geoinformatics	10	18.7.2005	11.5.2006	Nil	60,000	6000
5	M.Sc. in Geoinformatics*	10	18.7.2005	18.1.2007	Nil	1,08,000	10,800
<b>GEOINFORMATICS FOR HAZARD AND RISK ANALYSIS</b>							
6	Awareness Course	10	4.7.2005	15.7.2005	4,000	4,000	400
7	Certificate Course	10	4.7.2005	28.10.2005	Nil	24,000	2400
8	Post Graduate Diploma Course	10	4.7.2005	27.4.2006	Nil	60,000	6000
9	M.Sc. in Hazard and Risk Analysis*	10	18.7.2005	18.1.2007	Nil	1,08,000	10,800
<b>REMOTE SENSING APPLICATIONS : Theme Specific Orientation Course</b>							
10	Orientation Course in any area of Natural Resource Management, Environmental Assessment and Disaster Management	The theme based short courses of 2 weeks duration for a minimum of 5 to 10 participants may be organised on request basis as per the actual expenses					
<b>DECISION MAKERS COURSE</b>							
11	Overview Course	10	20.9.2005	23.9.2005	7,000 <sup>@</sup>	7,000 <sup>@</sup>	700 <sup>@</sup>
<b>INTERNATIONAL PROGRAMMES</b>							
12	Short Course in Remote Sensing and Digital Image Processing Sponsored by International Technical and Economic Co-operation (ITEC), Ministry of External Affairs, Govt. of India	20	10.1.2005	04.3.2005	12,000	12,000	1200
13	Remote Sensing and GIS Post Graduate Course conducted on behalf of Centre for Space Science & Technology Education in Asia Pacific – affiliated to the United Nations (CSSTEAP)	As per CSSTEAP Schedule (Web site <a href="http://www.cssteap.org">www.cssteap.org</a> )					
<b>NNRMS – ISRO SPONSORED COURSES</b>							
14	GIS Technology and Applications	10	2.5.2005	24.6.2005	Nil	12,000	1200
15	RS & GIS Applications to Water Resources	10	2.5.2005	24.6.2005	Nil	12,000	1200
16	RS & GIS in Forestry/Botany/Ecology/Environment	10	2.5.2005	24.6.2005	Nil	12,000	1200
17	RS & GIS in Urban & Regional Planning	10	2.5.2005	24.6.2005	Nil	12,000	1200
18	Cartography and Mapping	10	2.5.2005	24.6.2005	Nil	12,000	1200

\* Subject to accreditation process by TTC, the Netherlands

+ Optional streams : Agriculture & Soils, Forestry & Ecology, Geosciences, Marine Sciences, Urban & Regional Planning Digital Photogrammetry and Water Resources

++ Optional Streams : Coastal Zone Management, Forest Management, Geoscientific Applications, Soils and land use planning, Water Resources Management, Land Information System.

@ Includes boarding and lodging.

- NOTE:
- If the date of commencement falls on holiday, course will start from next working day
  - Sponsoring organizations are required to meet all expenses (no course fee is levied from Govt. sponsored candidates except courses at Sl. Nos. 6, 11 & 12) viz., traveling allowance, daily allowance, contingent expenses, medical expenses etc., for their candidates.
  - Government organizations include Central / State Government bodies / Autonomous Institutions and Universities.
  - Private & Self sponsored candidates have to pay full course fee.
  - **Last Date for Submission of Application form for M.Sc. - 10th December 2004.**

Dean / Technical Staff Officer, Indian Institute of Remote Sensing (NRSA), 4, Kalidas Road, Dehra Dun 248 001, UTTARANCHAL (INDIA)  
 FAX: 91 135-2741987; 2748041; PHONE: 91 135-2744583 / 2741267(direct); 2744518 (Ext-2005); E-mail: [dean@iirs.gov.in](mailto:dean@iirs.gov.in), [tso@iirs.gov.in](mailto:tso@iirs.gov.in)

Our Web Site [www.iirs-nrsa.org](http://www.iirs-nrsa.org)